ALKYLAMMONIUM-CATIONIC PESTICIDES INTERCHANGE IN CLAY MINERALS

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The interaction between organic compounds and clay minerals depends on grand manner of the characteristic of the cations present in the interlamellar space of the clay minerals. The study of the interaction between clay-organic compounds and organic cations is of great potential and practical importance in the field of agriculture, foundation engineering and a variety of industrial process.

The present work was undertaken: (i) to study the interaction between organo-clay complexes (decylammonium-vermiculite and decylammonium-montmorillonite) with cationic pesticide; (ii) the inverse process. The pesticides used were: chlordimeform, aminotriazole, diquat and paraquat.

The results obtained are shown in tables 1 and 2. In general, cationic pesticides adsorbed by clay minerals are displaced by alkylammonium in a short time, but the inverse process is more difficult, and in some cases decylammonium is not displaced at all.

On the other hand, the nature of the mineral used has an important influence in these processes. Decylammonium cations being displaced more easily in montmorillonite than in vermiculite. This difference is a consequence of the orientation and mode of packing of these cations in the interlamellar space, and the different charge density for both minerals. In general, cationic pesticides are also more easily displaced in montmorillonite than in vermiculite.

Finally, it is important to note the influence of the solvent used in the interaction processes. The treatment of decylammonium complexes with butanol solutions of chlordimeform produces completely different effects to aqueous solutions. The alkylammonium cations are decomposed to NH_4^+ and alkylic chains.

Key words: Alkylammonium, pesticide, montmorillonite, vermiculite.